NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division
Washington, DC 20594

September 13, 2012

Cockpit Voice Recorder

Specialist's Factual Report
By Bill Tuccio

1. EVENT

Location:	Henderson, Nevada
Date:	July 28, 2012, 0832 Pacific Daylight Time (PDT)
Aircraft:	Piaggio P180, N146SL
Operator:	Avantair, Flight 146
NTSB Number:	WPR12FA332

2. GROUP

A group was not convened.

3. SUMMARY

On July 28, 2012, at 0832 Pacific daylight time (PDT), a Piaggio P180, N146SL, arrived at Henderson Executive Airport, Henderson, Nevada, missing its left elevator. The airplane was operated by Avantair under Title 14 Code of Federal Regulation, Part 91K. The two crew and two passengers were unhurt, and the airplane was substantially damaged. Visual meteorological conditions prevailed, and an instrument flight plan had been filed. The flight originated at San Diego, California, at 0743. A solid-state cockpit voice recorder (CVR) was sent to the National Transportation Safety Board's Audio Laboratory for readout.

4. DETAILS OF INVESTIGATION

On August 2, 2012, the NTSB Vehicle Recorder Division's Audio Laboratory received the following CVR:

Recorder Manufacturer/Model: **L-3/Fairchild FA2100-1010**
Recorder Serial Number: **000301683**

4.1. Recorder Description

Per federal regulation 14 CFR 91.1045, this aircraft, as configured and operating under 14 CFR Part 91K, must be equipped with a CVR that records a minimum of the last 30 minutes of aircraft operation; this is accomplished by

recording over the oldest audio data. When the CVR is deactivated or removed from the airplane, it retains only the most recent 30 minutes of CVR operation. This model CVR, the L-3/Fairchild FA2100-1010, records 30 minutes of digital audio stored in solid-state memory modules. Four channels of audio information may be retained: one channel for each flight crew and one channel for the cockpit area microphone (CAM).

4.2. Recorder Damage

Upon arrival at the audio laboratory, it was evident that the CVR had not sustained any heat or structural damage and the audio information was extracted from the recorder normally, without difficulty.

4.3. CVR Channels

The recording consisted of three channels of audio information. Two of the channels contained audio information from the captain's and first officer's audio panels. The quality of these two channels was excellent[1]. One channel contained the cockpit area microphone (CAM) audio information. The quality of this channel was good. The fourth channel did not contain audio, nor was it required by law to do so.

4.4. Timing and Correlation

The times used in this report are expressed as Local Time of the accident (PDT).

Timing of the transcript was aligned with the aircraft landing time at Henderson, Nevada as provided by the Investigator-in-Charge. The landing time was 0832PDT. This time was aligned with the approximate landing time of 0023:40 CVR Elapsed Time, which is the time from the beginning of the recording. Using this information, the following relationship was applied: PDT = 0808:20 + CVR Elapsed Time.

4.5. Summary of Recording Contents

In agreement with the Investigator-In-Charge, a CVR group did not convene and only this summary report was prepared.

The recording began at 0808 as Avantair flight 146 was in level flight at flight level 210 enroute to Henderson, Nevada, with the captain acting as flying pilot. The crew was discussing options to shorten the flight routing, and the first officer requested a more direct route from air traffic control (ATC) noting they were behind schedule.

While enroute, the captain discussed a prior experience he had at the company shutting down an engine due to a baggage door warning. The captain noted the aircraft procedure requires the engine to be shut down for a baggage door warning, even though the warning may be spurious. The captain went on to discuss how the engine fire warning can be a similar spurious warning, requiring consideration if the warning is a false or real indication. The captain then

[1] See Attachment I for the CVR Quality Rating Scale

discussed when the aircraft was left on the ramp in the rain, the rain tended to adversely affect the seals and avionics in the aircraft; the captain suggested when rain is expected to hangar the aircraft.

At 0815, the aircraft was given a descent to 15,000 feet. The first officer tuned the ATIS for Henderson. ATIS information Charlie reported winds from 210 degrees at 11 knots, cloud cover greater than 5,000 feet, visibility greater than 5 miles, temperature 28 degrees Celsius, dewpoint -11 degrees Celsius, altimeter 29.99, and runway 17 in use. The first officer briefed the captain on the ATIS. The crew concluded both runway 17 right and left were in use.

At 0817, the captain briefed the visual approach to runway 17 right, noting it to be the longer runway. The captain concluded his briefing by asking the first officer to call the fixed based operator (FBO) and coordinate the rental car. The crew then noted their scheduled arrival was 0822 and they would only be about 8 minutes late.

At 0818, ATC cleared the aircraft to descend to 10,000 feet 35 miles south of Las Vegas. The first officer then radioed the FBO and coordinated the rental car. After coordinating the rental car, the first officer advised the passengers of rental car logistics.

At 0821, the captain noted the altimeter was 29.99 and asked for the descent checks. The crew executed the descent checks in a challenge/response manner, including items of the altimeter, recognition light, windshield heat, pressurization, and ATIS.

At 0824, the crew noted they were out of 10,000 feet for 9,000 feet. Shortly thereafter, the crew agreed the airport was in sight, and the first officer advised ATC the airport was in sight. At 0825:11, ATC cleared the aircraft for a visual approach to runway 17 right, with a left downwind traffic pattern entry.

At 0826, the crew executed the approach checks, including items of avionics, approach briefing complete, autofeather armed, prop sync off, seat belt sign on, “P-F-Ds” secured, and checklist complete. Thereafter, the crew continued to call out altitudes in the descent for the visual approach.

At 0827, ATC advised the aircraft to contact Henderson Tower. The first officer contacted Henderson Tower and was told to report a left midfield downwind for runway 17 right.

At 0828:59, the first officer reported abeam the tower and was cleared to land on runway 17 right.

At 0829:15, the captain asked for gear down and landing checks. After a sound similar to landing gear extension, the crew executed the before landing checklist including items of landing gear down, hydraulic pressure, condition levers set, and flaps indicating mid. The captain asked for full flaps, and the first officer continued the checklist items of speed checks, landing light, autopilot and yaw damper off, flaps down, and before landing checks complete.

From about 0830:05 until touchdown, the CAM and audio channels recorded a slight rattling sound.

At 0831:24, an automated voice annunciated “five hundred above, sink rate, sink rate.” The captain replied, “correcting.”

At 0831:53, the captain said, "ha ha."

At 0831:55, the first officer said, "crazy isn't it?"

At 0831:56, the captain said, "yeh."

At 0831:57, the captain said, "there it is right there."

At 0831:59, the captain said, "alright props forward."

At 0832:02, the captain said, "yeh it's really bad at the end there."

At 0832:08, the first officer said, "sixty knots."

At 0832:09, the captain said, "and ground idle."

At 0832:14, the first officer said, "forty knots."

At 0832:19, the tower told Avantair 146 to contact ground. The first officer contacted ground and was provided taxi instructions. As the crew taxied the aircraft, the captain noted they were only 10 minutes late, the first officer acknowledged. The first officer then performed the after landing checklist.

During the taxi, the captain noted, “now it feels kind’a…uneven…it’s weird.” After an unintelligible statement, the captain continued, “but on that flare there…it was like.”

The first officer replied, “that's what I felt in San Diego as well. it's kind'a like it's on a bungee or somethin'.” The captain then said, “yeh…it’s weird.”

At 0835, the background sound decreased, similar to the sound of engines winding down. The CAM recorded the captain saying good bye to the passengers.

At 0836, there was a power interruption to the CVR.

Following the power interruption, the CAM recorded a two and half minute cell phone call starting out, “hi @[2]Barry, @ on one forty six.” Only the captain part of the cell phone call was recorded.

The captain began by advising he tried to give “them” a heads up in the air but could not reach “them.” He said, “On the leg out of ah Camarillo and San Diego my F-O told me it..it felt kind'a strange uhm. We not getting any elevator control at ah rotation to almost about one twenty probably even ah farther than that ah on this airplane. And ah on our landing too. On ah flare. I have no real..no real ah control. It looks like there is an area of uh of uh limbo there on the ah on the elevator on touchdown.”

The CAM recorded unintelligible sounds similar to the other party to the call talking for a few seconds.

The captain then continued, “No it’s a dead spot...ah we we we were all the way back...on the departure out of ah San Diego I went full ... I went ah ah... I went all the way back on the elevator at rotation speed of one-oh-six which is what we were supposed to be at and I kept it all the way back there ‘til one twenty or maybe a little bit more before I even rotated off the ground which is ah unusual.” The captain continued, “On the departure out of Camarillo, my F-O said it like oh man it feels strange, and I saw him pull all the way to the back. But I didn't have a feel of it so I didn't...we were in a hurry so I didn't call but…but on this one...it's it’s really weird.” The captain then noted he did not get a similar control response “yesterday coming out of Van Nuys.”

The captain went on to say he was going to call the previous captain who had flown the aircraft to see if that captain had a similar issue.

[2] @ is used to highlight or replace an individual’s name.

The captain continued, “but ah it's strange I never had that feel before on ah an airplane...I checked the trim tab back there and it's uh…uh the ah elevator and it's right where it’s supposed to be the trim is right where it's supposed to be if anything we were…we were at aft CG not forward CG either so...which is weird.”

The CAM recorded unintelligible sounds similar to the other party to the call talking for a few seconds.

The captain then said he was okay taking the plane on to Camarillo, adding “I don't know how that would work out ahhhh writing it up when we get there...I'm but uhm I'm definitely not going to go to any mountainous airport or short runways.”

The CAM recorded unintelligible sounds similar to the other party to the call talking for a few seconds.

The captain concluded by asking the person with whom he was talking to get back to him and tell him what they wanted him to do. The captain re-iterated he was okay taking the plane to Camarillo since “we are light and we ah have a pretty decent runway here.” The captain also suggested, “if you want to have somebody check it here that’s up to you.” The call then concluded and the captain said good bye.

After the call, the first officer was recorded saying “it’s right in the middle of the elevator.” As the captain was responding, power was interrupted to the CVR.

The power returned to the CVR for about 12 seconds, during which time there was a sound similar to a camera shutter followed by the sound of a switch. The recording then ended.

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Vehicle Recorder Division

Attachment I

CVR Quality Rating Scale

The levels of recording quality are characterized by the following traits of the cockpit voice recorder information:

Excellent Quality Virtually all of the crew conversations could be accurately and easily understood. The transcript that was developed may indicate only one or two words that were not intelligible. Any loss in the transcript is usually attributed to simultaneous cockpit/radio transmissions that obscure each other.

Good Quality Most of the crew conversations could be accurately and easily understood. The transcript that was developed may indicate several words or phrases that were not intelligible. Any loss in the transcript can be attributed to minor technical deficiencies or momentary dropouts in the recording system or to a large number of simultaneous cockpit/radio transmissions that obscure each other.

Fair Quality The majority of the crew conversations were intelligible. The transcript that was developed may indicate passages where conversations were unintelligible or fragmented. This type of recording is usually caused by cockpit noise that obscures portions of the voice signals or by a minor electrical or mechanical failure of the CVR system that distorts or obscures the audio information.

Poor Quality Extraordinary means had to be used to make some of the crew conversations intelligible. The transcript that was developed may indicate fragmented phrases and conversations and may indicate extensive passages where conversations were missing or unintelligible. This type of recording is usually caused by a combination of a high cockpit noise level with a low voice signal (poor signal-to-noise ratio) or by a mechanical or electrical failure of the CVR system that severely distorts or obscures the audio information.

Unusable Crew conversations may be discerned, but neither ordinary nor extraordinary means made it possible to develop a meaningful transcript of the conversations. This type of recording is usually caused by an almost total mechanical or electrical failure of the CVR system.